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ABSTRACT

This paper traces the evolution and application of asynchronous teaching and learning tools at Bradley University (Illinois), emphasizing their use in teacher education. The paper details the utilization of e-mail, the World Wide Web, and CyberProf, highlighting collaborative projects that emphasize mentoring and professional development. In the 1980's Bradley University began equipping the campus with networked computers. Faculty and students began to teach and learn asynchronously using e-mail. Project Telecommunications in Education sent student teachers into their student teaching assignments equipped with computers, modems, and e-mail access. Student teachers could communicate with university supervisors, fellow student teachers, and other e-mail users about the student teaching experience. They used listservs to communicate asynchronously with faculty. Student teachers put their journals on e-mail, which offered faculty convenient access to them. Faculty and students use the World Wide Web for source materials, publications, communication, and delivery of entire courses. A partnership between the university's Slane College of Communication and Fine Arts and the College of Education and Health Sciences has resulted in the production of interactive CD-ROM's as learning tools for medical students. The College of Education and Health Sciences is conducting a project to utilize technology to improve student learning in mathematics and science, provide relevant clinical experiences for preservice educators, encourage inservice teachers to develop online projects, and employ preservice teachers as technology mentors. Asynchronous learning tools have enhanced teacher education in many ways including creating links with the K-12 community, providing professional development opportunities, encouraging collaborative relationships, and developing new ways of mentoring. (SM)

Using Asynchronous Learning Technology to Make the Connections Among Faculty, Students, and Teachers

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Abstract

The development and application of asynchronous learning technology in teacher education at Bradley University is described. The use of electronic mail, the world-wide web and CyberProf as asynchronous learning tools are detailed. Various collaborative projects that focus upon mentoring and professional development will be featured, such as a collaborative project between the College of Education and Health Sciences and the Slane College of Communication and Fine Arts which developed CD-ROM's to be used as stand-alone asynchronous learning tools by medical students. Also, a project will be discussed linking preservice and inservice teachers, teacher educators, and K-12 students in a mentoring and professional development relationship in mathematics and science.

Using Asynchronous Learning Technology to Make the Connections Among Faculty, Students, and Teachers

This paper will trace the evolution and application of asynchronous teaching and learning tools at Bradley University with a special emphasis on its use in teacher education. Technology is viewed as a vital tool in the teaching and learning process and asynchronous learning is a methodology which is increasing in emphasis (Technology and the new professional teacher, 1997). Collaborative projects that focus upon mentoring and professional development will be featured.

Asynchronous Learning Defined

Asynchronous learning is defined as learning which takes place between teacher and learner independent of place and time. Printed media such as books have long been the dominant means of asynchronous learning. Advances in technology such as electronic mail, listservs, web pages and interactive non-linear multimedia have now made many additional modes of asynchronous learning possible.

Infrastructure

More than ten years ago, Bradley University entered into a partnership with A.T.&T. to begin equipping each residence hall room with a computer connected to the campus network through fiber optics. At about the same time, faculty offices were similarly equipped. This basic change in campus infrastructure, one of making computing power and network access available to students' rooms and professors' desktops, was the necessary first step in the process of moving toward asynchronous learning. In order for any form of asynchronous learning to take place using computers, all parties involved in the teaching and learning process must have access. Presently, all residence hall rooms and faculty offices have computers connected to the network and to the internet.

Electronic Mail as a Pedagogical Tool

One of the first applications used by faculty and students to teach and learn asynchronously was electronic mail (e-mail). Electronic mail removed the limits of time and place which traditionally tended to restrict the teaching and learning process to prescheduled class time or faculty office hours. Students used e-mail to ask faculty for additional examples, clarification of class discussions, or to express thoughts about the topic at hand in a manner which was perhaps not as threatening as speaking aloud in class. As the power of e-mail began to be visualized, new uses for it were uncovered.

Project Telecommunications in Education (TIE) (McMullen, 1994) was a project conducted in the early 1990's in the department of teacher education. This project involved sending student teachers into their student teaching assignments equipped with an Apple II computer, a modem, and an account on the Bradley University FrEdMail node. FrEdMail (Free Educational Electronic Mail) was a nationwide system of computer bulletin boards designed to link teachers with electronic mail. Both elementary and secondary education student teachers participated in the project. These student teachers communicated with the university supervisor, their fellow student teachers, and other FrEdMail users about the student teaching experience. They shared problems and solutions, lesson ideas, and even managed to involve their classes in collaborative activities — sometimes with students in classrooms in other parts of the world.

Another tool employed by the department of teacher education was that of listservs. Listservs enabled efficient mass asynchronous communication among faculty and students. Faculty used listservs to post announcements and questions related to the class. Students were able to pose questions for the class and receive multiple points of view.

Reflective thinking is stressed throughout the teacher education curriculum. A concrete assessment of this process is made by requiring students to keep reflective journals during some courses, particularly field-based courses. Prior to the advent of widespread computer use, students kept these journals in a notebook which was collected periodically by the instructor, read, and returned to the students. This

inefficient method has mostly been replaced by electronic mail journaling (McMullen & Wolffe, 1994). Students keep their journal by making e-mail entries in an "electronic notebook". The benefits of this method are tremendous.

Students can still put down their thoughts at convenient times, but faculty can now have instant and frequent access to these journals. Faculty can read the journals immediately after they have been written and respond to the students with meaningful feedback. The reflective journals become an ongoing dialogue between student and faculty member providing a powerful tool to connect theory to practice. Wolffe (in press) found that students enrolled in an elementary mathematics methods course, who used e-mail journals to share what they were learning and to reflect upon that learning with their instructor became more cognizant of their learning styles, more effective learners, and began to connect their collegiate course work with their future aspirations.

World Wide Web as a Pedagogical Tool

Because Bradley University faculty and students were already connected to the internet in residence halls and offices, it has been relatively easy to incorporate the vast possibilities of the World Wide Web (web) into the teaching and learning process. The web has always served as an asynchronous learning environment with content being available anytime and anyplace. Faculty and students at Bradley have used the web for many purposes including: 1) source material, 2) publication, 3) communication and 4) delivering entire courses.

Many faculty members have encouraged students to include sources from the web in papers and projects. Professors have also provided guidance in determining the reliability of web sources. Education students have created individual web pages which feature content and links to sources on various topics. Faculty members early on began constructing web sites for their courses as their skills would permit. These course web sites usually contained the information found in the course syllabus, as well as discussion boards, handouts, and links to other related web sites.

To encourage more faculty to utilize the web, Bradley University's Office of Teaching Excellence and Faculty Development created the Center for Asynchronous

Learning (CAL). CAL's mission is to assist faculty members with the creation and maintenance of course web sites. CAL adopted CyberProf (Latta, 1995-96; Many, 1996) for the management of course-related web sites. Students enrolled in a CyberProf course have many asynchronous learning options available including reviewing the course syllabus, viewing handouts, participating in a discussion group, sending e-mail to the faculty member or other students in the class, reviewing grades, taking practice quizzes, and accessing related internet links. There is also general internet help and a place for student suggestions.

The University has recently provided stipends to faculty who wish to develop future courses that will be entirely web-based. These new courses will be taught to students off-site during interim and summer sessions. It was determined that faculty need time and support to develop these courses which will be delivered in the new format. Students located anywhere in which they have computer on-line access may enroll.

Interactive Nonlinear Multimedia and Pedagogical Applications

In a partnership, Bradley University's Henry P. Slane College of Communication and Fine Arts and the College of Education and Health Sciences have teamed up with the University of Illinois College of Medicine at Peoria to produce interactive CD-ROM's. These CD-ROM's have been designed from the beginning as stand-alone asynchronous learning tools to be used by medical students. Faculty from both colleges at Bradley and from the College of Medicine have collaborated with senior level multimedia students at Bradley to produce these CD-ROM's. The initial project involved the creation of three separate CD-ROM's.

In the first project, a medical educator worked with three Bradley multimedia production students on a project entitled "The Medical Maze." With Bradley faculty members providing technical, aesthetic and pedagogic guidance, the students created a learning tool for first year medical students. In this CD-ROM, the medical students can "examine" a simulated patient with the goal of making a correct diagnosis by formulating the right questions, conducting the appropriate examinations, and ordering the necessary laboratory testing.

Another group of students was assigned to a hematologist, who worked with them as they created a project named, simply, "Blood." This CD-ROM presents an attractive interface for a multiple-choice quiz reinforcing the terminology and the identification strategies in blood pathology.

The third project completed was not an educational CD-ROM, per se, but rather was an inventory of the cultural, environmental, and social aspects of the mid-state Illinois region. It is the intention of the School of Medicine to send this CD-ROM to candidates for its residency program so that they may be better informed about the Peoria area's many attractions.

Working together with physicians, our colleagues in other disciplines, and undergraduate students was an eye-opener for all concerned. The students came to learn more than they could have anticipated about the medical subject matter; the physicians came to appreciate the capabilities and complexities of interactive non-linear multimedia as a teaching and learning tool; and the Bradley faculty involved in the projects have a new understanding of the importance of group dynamics in bringing such projects to fruition. Because the first projects were such a great success, it is anticipated that many more joint efforts will follow involving more education and multimedia students.

Additionally, Bradley University is providing internal grants to faculty who would like to develop multimedia courseware. The faculty who are selected will work with multimedia students to produce interactive CD-ROM's. Several education faculty have submitted proposals. For example, one faculty member wishes to construct a CD detailing the educational system in China from information gathered from a Fulbright study trip. A key element necessary to the successful creation of multimedia materials for classroom use is a strong partnership between teacher education and multimedia departments.

Asynchronous Mentoring and Professional Development

The College of Education and Health Sciences is currently involved in a grant project with funding from the Corporation for Public Broadcasting entitled Team 2000. Team 2000 is a project designed to utilize technology to improve student learning in

mathematics and science, provide relevant clinical experiences for preservice educators, encourage current educators to develop on-line projects, and to employ preservice teachers in the role of technology mentors.

Twelve preservice educators will be paired with twelve inservice teachers. These teachers represent an area high school and its' eight feeder elementary schools. The teams will receive modest funding to initiate and employ a student-centered project using technology to improve math and science education. Each team will decide upon the specific content and type of project with input from the other teams. Once the project is underway, teams will communicate with each other using e-mail and web-based conferencing. Each team will provide project updates and a project summary which will be available on a common web site.

While much of the mentoring in this project will occur in traditional face-to-face mode between individual members on a team, an additional component of asynchronous mentoring will be used to enhance the interactions among teams. Participants in the project will be able to offer advice and assistance using web-based discussion boards. This asynchronous mentoring should greatly enhance the amount of knowledge which can be shared and strengthen the links between the college and K-12 schools.

Summary

Bradley University has been employing asynchronous teaching and learning tools for many years. Asynchronous learning tools have enhanced teacher education in many ways including creating links with the K-12 community, providing professional development opportunities, encouraging collaborative relationships, and developing new ways of mentoring. While the tools are evolving, the general purpose of providing the most timely and direct interaction among students and faculty has remained a constant in the application of asynchronous tools in the teaching and learning environment.

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